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THE VETERINARY JOURNAL

A Monthly Review of Veterinary Science.

Editor:
FREDERICK HOBDAY, F.R.C.V.S., F.R.S.E.,
HONORARY VETERINARY SURGEON TO HIS MAJESTY THE KING.
MAJOR IN THE ARMY VETERINARY CORPS.
HONORARY MEMBER OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.
CORRESPONDANT ÉTRANGER DE LA SOCIÉTÉ DE MÉDECINE VÉTÉRINAIRE DU BRABANT (BELGIUM

Sub-Editor:
GLADSTONE MAYALL, M.R.C.V.S.

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CONTENTS.

The late Lieut.-Colonel H. M. LENOX-CONYNGHAM, D.S.O. *Frontispiece*

EDITORIALS—

The Inclusion of Horse-Flesh in the Food Ration Scheme 155
The Veterinary Student and the Continuation of the War 156

ORIGINAL COMMUNICATIONS—

Conference of Officers of the French and British Army Veterinary Service, held in France, January 12th, 1918:

IV.—Periodic Ophthalmia. By Col. A. C. NEWSOM, C.M.G., D.D.V.S. 157
V.—The Control and Treatment of Mange and other Contagious Diseases. By Major E. J. WADLEY, D.S.O., A.D.V.S. 161

Note on the Results of a Certain Number of Operations for Laryngeal Paralysis on Active Service. By Col. NEWSOM, C.M.G., D.D.V.S. 167
Treble Strangulation of the Ileum in a Horse. By Capt. R. C. G. HANCOCK, A.V.C. 168
Some Remarks and Suggestions on the Vaccine and Serum Methods of Treatment of Ulcerative Lymphangitis. By Capt. E. A. WATSON, C.A.V.S. 170
Treatment of Injury of the Spine in the Dog by Suspension. By G. MAYALL, M.R.C.V.S. 175
Hepatic Echinococci as a Mechanical Cause of Chronic Tympanitis in Cattle. By HENRY E. EVE, M.R.C.V.S. 176
Notes of a Case of Complete Dislocation of the Left Femur in a Cow. By Capt. A. R. ROUTLEDGE, F.R.C.V.S. 177
Sarcoptic Mange in the Dog and Purulent Ophthalmia in a Bull Bitch. By G. MAYALL, M.R.C.V.S. 178
Braxy: With Special Reference to the Disease as Seen in North Cardiganshire. By E. MORGAN, M.R.C.V.S. 179

TRANSLATIONS—

Double-side and Extensive Cysts 186
Two New Feeding-Stuffs 188

ABSTRACT 189
NOTICE 190
REVIEWS 190
OBITUARY 192

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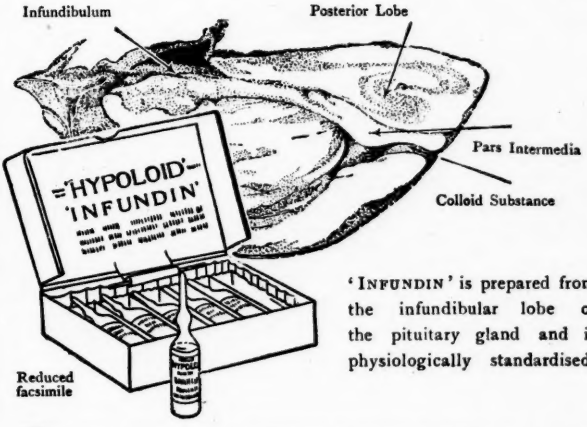

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Sub-Editor:

GLADSTONE MAYALL, M.R.C.V.S.

MAY, 1918.

Editorials.

THE INCLUSION OF HORSE FLESH IN THE FOOD RATION SCHEME.

The inclusion of horse flesh in the list of foods in the ration scheme has given official recognition to this commodity as a recognised article of meat dietary in Great Britain, and there is no doubt that it will speedily become as great a necessity amongst certain classes as it has done in the Allied countries. In France, Belgium, and Italy the horse butchers are prosperous men, and their shops in every way compare favourably in cleanliness and general sanitary arrangements with those of the purveyors of beef or mutton. The prices usually fixed by law are considerably less than those of beef, and the trade which is done affords ample proof of the popularity of horse flesh as a nourishing article of diet. For example, at the present moment in a certain town in Italy the official prices fixed by the Town Council for beef are as follow: The best joints, 3.50 to 4.40 lire per kilogramme, if purchased with the bones, or 5.60 lire without bone; whilst corresponding parts of horseflesh cost 2.40 lire and 3 lire respectively; there being no difficulty about selling all that can be obtained. Horse flesh is everywhere considered an excellent and nutritious food, and, except for the sentimental aspect of the question, there is not the

slightest reason why it should not be made an issue ration to the Army just as much as beef or mutton. Everyone who has tasted it, and thousands of others who have eaten it unwittingly, speak well of it, and if nicely cooked and served in the same manner as a good beef steak it takes someone who is more than an ordinary epicure to detect the difference.

To officially recognise horse flesh as an article of meat food, for issue to the troops, would set free an enormous number of cattle for meat distribution at home, and would not by any means be unacceptable by the men themselves. Unfortunately, owing to the wastage of war there must always be horses to kill, and allowing them all to be sold to our Allies to supplement their food supply is a short-sighted policy which should be remedied. Horse flesh should be utilised to best advantage, and thus take its proper place with other necessary foodstuffs.

THE VETERINARY STUDENT AND THE CONTINUATION OF THE WAR.

In response to the urgent application of the General Medical Council the *bona fide* medical student who had been actively pursuing his whole time medical studies for six months prior to the war, and had passed the whole of the professional examination in chemistry, physics and biology (or botany and zoology) for a medical degree or licence, is permitted to be transferred (regardless of his medical category) to the Reserve for the purpose of resuming his studies with a view to obtaining a medical qualification.

When transferred, he must immediately resume his medical studies and enrol in an Officers' Training Corps, as otherwise he will be recalled to the Colours.

The *bona fide* veterinary student who was attending college before the war ought to be allowed the same privileges, for the veterinarian is of equal importance to the welfare of the country as his medical *confrère*, and the shortage of properly qualified professional men after the war is bound to be an appreciable one. The control of contagious disease amongst animals is very necessary if a country is to be prosperous, and the prosperity of England depends very largely upon agriculture. The training of a veterinary surgeon takes at least four years, and it is our duty as a profession to back up the College Council to the fullest extent in its efforts to regulate the supply to meet the demand.

Original Communications.

CONFERENCE OF OFFICERS OF THE FRENCH AND BRITISH ARMY VETERINARY SERVICE, HELD IN FRANCE, JANUARY 12TH, 1918.

(Concluded from April issue.)

IV—PERIODIC OPHTHALMIA.

By Colonel A. C. NEWSOM, C.M.G., D.D.V.S. (*Southern*).

This disease, though not existing in Great Britain to any alarming extent prior to the beginning of the present war, is known to have been well established in certain parts of Europe, America, Canada, South Africa, and India, where from time to time its presence has caused considerable trouble and no small amount of loss.

It first gave evidence of its existence amongst the animals of the British Expeditionary Force in France about the end of December, 1916, and since that time it has been steadily increasing in extent.

In 1891, Dr. Rolland, an ophthalmic surgeon of Toulouse, appears to have made a special study of the disease, and to have assigned its cause to the rheumatic nomad of Klebs.

Dr. Rolland made too strong a point of attachment of the iris to the crystalline lens as the one and only symptom of the disease; and from the fact that his opinion lacks the support of subsequent workers it is obvious that his views have not met with general approval.

In an American publication, dated 1916, it is defined as "an inflammatory affection of the interior of the eye, intimately related to certain soils, climates and systems, showing a strong tendency to recur, and ending in blindness from cataract and other serious injury."

This definition is unsatisfactorily vague and, in my experience, wrong, for, as far as can be observed, cataract is by no means a common sequel, since from a very large number of *post-mortem* examinations made it has been noticed that the appearance of cataract is really due to an opacity of the vitreous humour, and that actual disease of the lens is very rare indeed. That heredity plays an important part is probably beyond question; hence the legislation, which is more or less general in all countries where the disease exists, for stopping the employment of known infected animals for breeding purposes. That it should be looked on as a sequel of certain specific diseases (influenza, strangles, etc.) is an opinion largely held, but this view appears to suggest a want of definite knowledge.

It is possible that, given an inherited weakness, climatic conditions,

attacks of debilitating diseases, bad feeding, overwork, etc., may all operate; but it is submitted that there must be some very definite influence operating to produce such definite consequences. All effort on the part of those working on this subject in the British Expeditionary Force to find a specific organism in an affected organ has failed, nor has it been proved possible to directly transmit the disease from animal to animal. That the primary condition is an iritis associated with ciliary inflammation (irido-cyclitis) seems beyond question, and that the other symptoms met with are the natural sequels of this inflammation there can be little doubt; but it still has to be learned what is the actual cause, and exactly how that cause operates.

Periodicity.—The thirty days assigned by French law as the probable limit of period of recurrence is not borne out by experience in the British Army. Cases have been met with in which, for no apparent cause, acute attacks follow one another with such rapidity as to suggest a continuance of the original trouble; and in other cases regular six monthly, or even annual, attacks have been seen.

Treatment.—In the hands of most operators in the British Expeditionary Force the injection of from 1 to 3 or 4 c.c. of Lugol's iodine into the supra-orbital fat has been found to cut short acute attacks.

In all cases the employment of atropine is clearly indicated and is always attended with good results, as not only checking the original iritis, but preventing the synechia upon the existence of which, in all probability, all further complications depend.

The local application of adrenalin and the internal administration of depletives are beneficial as directly influencing blood pressure.

When amaurosis has developed or, as often happens, detachment of the retina takes place, incurable blindness results.

In cases of cloudiness of the fluids of either the anterior or vitreous chambers, or of the cornea, good has been found to follow the injection of an 8 per cent. solution of common salt into Tennant's space in the case of the vitreous chamber, or under the orbital conjunctiva in the case of the anterior chamber or cornea.

No agent administered by the mouth has been found to do good.

Prevention.—In the absence of precise knowledge as to cause preventive measures can only be general. The conditions of life of the animal should be made as hygienic as possible in every detail, and till such time as a conclusion is reached it is perhaps as well to remove all actively infected cases from amongst the healthy with the least possible delay.

DISCUSSION.

General Moore remarked that this disease was causing him grave concern, and that in absence of knowledge of the cause the position in relation to it seemed somewhat hopeless. During the last year it had been gradually increasing, and to-day there were upwards of 2,000 animals under treatment. He did not look on it as a new disease, and he had himself known it for a very long time. In times of peace it had never been his experience to meet with many cases at one time; but with the number of animals at present in the Field it seemed more than ordinarily severe, and likely to cause a large amount of inefficiency and loss. He would be glad of any assistance from General Fray and his officers in regard to its elucidation.

Some weeks ago a meeting of Administrative Veterinary Officers was held, and certain questions were placed before them. The questions considered and discussed were the following :—

(1) Whether periodic ophthalmia is contagious or otherwise.
(2) The cause of it.
(3) Bacteriological investigation as to cause.
(4) Anatomical and *post-mortem* investigations.
(5) Circumstances attending incidence and increase of the disease.
(6) Conditions of horse lines in relation to the disease.
(7) Periodicity.
(8) Class of animals attacked.
(9) Stables *versus* open standings. Whether it was more common in stables or open standing.
(10) If locality had anything to do with the disease.
(11) If diet, water, period of the year, had any influence on it. Also if our calcium sulphide baths or other means used in the treatment of mange have anything to do with incidence.

After discussion on these headings had taken place, a policy was drawn up with regard to reduction of the disease and treatment. The opinion as to whether it is contagious or not is very varied indeed. Some officers are firmly of the opinion that the disease is contagious; but the majority considered it not so, though regarding it as a specific disease. Opinion as to cause is absolutely indefinite. Bacteriological investigation had failed to reveal any causal organism, and the anatomical and *post-mortem* investigation had likewise led to little or no satisfactory result. Most officers consider that the disease is just as prevalent in stables as it is in outside standings; and that diet, water, period of the year, and the calcium sulphide baths have nothing whatever to do with its incidence.

The opinion with regard to periodicity varied, and no particular class of animal seemed more prone to attack than others.

Policy towards Reduction.—The policy which has been adopted is a very long one, but the substance of it is that every case of ophthalmia, on being found, at once received an injection of 1 c.c. of Lugol's solution into the supra-orbital fat. Subsequently they are taken away from the units and sent to the mobile veterinary sections, which evacuate them to hospitals for treatment. This is the policy in brief. Affected horses in remount depots are evacuated direct to veterinary hospitals; endeavour is made to get all cases into special wards in each veterinary hospital.

A good many of the cases which were sent down from the Front diagnosed as specific ophthalmia were, in his opinion, not really cases of this disease at all. Anxiety on the part of veterinary officers to reduce the disease in their units is such that they may readily evacuate cases which are really not typical, but more in the nature of conjunctivitis, and simple ophthalmia. Up to the present the disease has not occurred in veterinary hospitals in the British Expeditionary Force, all cases coming from units at the Front.

General Moore further expressed the opinion that insanitation had a considerable influence in the production of specific ophthalmia, and again referred to the enormous quantity of manure and urine derived from the Army animals on the British Front, and said it would be difficult to believe that no deleterious effect on animals could result from such contamination. Notwithstanding this, the extent to which ophthalmia prevails is not great when compared with the number of animals in the Field.

The disease is also met with in animals newly arrived from overseas. Amongst 660 horses that were landed in the latter half of November, two showed active signs of ophthalmia, while three showed evidence of previous attacks. The next week's shipment revealed two more with active signs and three as having had previous attacks of this disease—that is, five out of 1,130. For this week, out of 1,000 we have had three showing active signs of the disease on coming into the country and four as having had the disease.

Major Nicolas said "Fluxion Periodique" (specific or periodic ophthalmia) was not considered by the French authorities to be contagious; but it was believed to be infectious, though no specific causal organism had been discovered. No proof had, however, been given as to its contagious character or otherwise.

Two different micro-organisms had been found in affected eyes, and these were thought by Professor Dor to be the specific ones in ophthalmia. Major Nicolas thought the divers organisms isolated

from cases of ophthalmia pointed to the conclusion that various agencies were capable of determining the disease.

Apart from specific agencies, it had been thought that "slimy" forage might be a cause of the complaint.

In an outbreak of ophthalmia at Lyons, however, which caused considerable loss, no causal organism could be discovered, nor could it be proved that the disease was due to the fodder supplied.

French opinion favoured the influence of certain localities in the production of ophthalmia, and his own view was that humidity played an important part in causation. It had been noted that certain districts, notably the North of France, especially on the Somme, as well as certain stables, predisposed to the disease. In one place where horses affected with the disease were stabled, nearly all horses were affected. In another case a stable was noticed to be infected; it was disinfected and the disease disappeared.

Major Drouin observed that a large number of iritis cases or of "iridocyclitis" were simply secondary localisations of general infections, such as obtained in typhoid diseases, and especially of the one appearing in America under the name of "pink-eye."

Major Nicolas regarded the nature of the disease as very similar to that of "pink-eye," pericarditis, pneumonia, and pleurisy, but it was not in any way a sequel of those diseases.

He agreed with General Moore that the disease occurred amongst animals irrespective of whether they were stabled or placed on open standings.

As to the recurrent character of the complaint, he further said there was nothing in its clinical aspect to show whether it recurs or not.

Major Nicolas greatly favoured treatment with local application of atropine, 1 per cent. in oil or vaseline. This drug seemed to prevent or remove synechiæ, and generally minimise the extent of the lesions.

The principle as regards disinfection of stables occupied by animals suffering from ophthalmia was to deal with them as if the disease were due to some undiscovered specific agency.

V.—THE CONTROL AND TREATMENT OF MANGE AND OTHER CONTAGIOUS SKIN DISEASES.

By Major E. J. WADLEY, D.S.O., A.D.V.S.,
Headquarters Veterinary Directorate.

Although in peace-time mange is practically non-existent in the British Army, our experience in previous campaigns, notably that of South Africa, made us prepared to a large extent for what was likely to happen in this war.

History.—In the first twelve months of this campaign, by strict supervision mange was kept well under control, and the numbers affected were small; but as our army in the Field increased, supervision became more difficult, and in December, 1915, and January and February, 1916, the occurrence of the disease became more frequent.

Immediate steps for control were taken, with satisfactory results, the spread of the disease being checked. A recurrence to a slight extent occurred in July, 1916, which was again checked, only to reappear in March and April, 1917, when the maximum figures were reached; but the methods of control which I now mention were brought into force, with the result that in October and November, 1917, the numbers affected were reduced to a lower figure than they had been since March, 1916.

General System of Control at the Front :—

1. Rigid inspection of all animals daily by regimental officers, and report made should any be found affected or doubtful.

2. Regular weekly inspection of all animals of each unit by the veterinary officer in charge, and a certificate as to freedom from contagious disease rendered.

3. Immediate segregation of all affected and doubtful cases until seen by the veterinary officer.

4. Working isolation, as far as possible, for the remaining animals of the unit. Transfers of animals from an affected unit to another being forbidden.

5. Disinfection of all equipment, etc., under the supervision of a veterinary officer.

6. Transfers of all affected and suspected animals to the Mobile Veterinary Section, and subsequent evacuation to veterinary hospitals in special trucks which are marked, the animals being labelled and accompanied by evacuation rolls.

7. Disinfection by Army Veterinary Services of all railway trucks which have been used for sick horses.

8. The erection of dipping baths in corps areas, fully equipped with means for disinfection, and subsequently for drying, large quantities of harness, rugs, and equipment.

These dips are kept in constant use, as far as the military situation will allow, the incontact animals from affected units being regularly dipped. In addition, full use is made of them by other units with a view to prevention, as many as 3,000 animals passing through one bath in a week, and they have undoubtedly proved of very great value in controlling the disease.

Control in Remount Depots.—Similar steps for control have been taken in remount depots, all affected or suspected animals being immediately transferred to a veterinary hospital.

Varieties of Parasites Found.—It will be apparent from the foregoing that a certain proportion of the animals evacuated are found on further examination to be free from mange; but it has been found better to be on the safe side and clear units of all doubtful cases, than leave them with the certainty that a proportion will prove to be affected.

A record compiled by Colonel W. Pallin, D.S.O., of the results obtained from the microscopical examination of scrapings taken from a very large number of animals evacuated for mange and contagious skin disease, or as "close-incontacts," are of great interest as showing the frequency with which different parasites were found. Given in percentages, the figures are :—Negative, 24·71; lice, 1·71; sarcoptic, 46·15; psoroptic, 4·57; symbiotic, ·83; dermatodectic, 4·52; forage acari, 14·72; ringworm, 1·81.

Treatment.—All actual treatment is carried out in certain veterinary hospitals which are specially equipped and devoted entirely to this work. In the early stages of the war we depended upon sulphur made up with an oily base, such as lard, whale oil, or train oil (ol. picis, ol. tereb, or creosote being sometimes added); but it soon became apparent that, though valuable in treating individual cases, it was unreliable, expensive, and likely to cause damage to the skin when one was dealing with large numbers.

In January, 1916, we adopted the system used in Canada and other British Colonies, which is the complete immersion of the animal in hot solution of calcium sulphide. Specially constructed dipping bath, with a capacity of about 3,500 gallons, is filled with calcium sulphide solution prepared at the rate of 2½ lb. sulphur, 1 lb. lime, and 8 gallons of water, heated by direct steam to a temperature of 42·5° C., the animal jumping in and passing quietly through. These baths are repeated two to three times weekly for from three to seven weeks, according to the extent of the disease, the patient being groomed daily and washed once weekly.

The treatment is beyond question effective, even in the most advanced cases of sarcoptic mange, the only objection being that it is slow. The solution is non-poisonous, and non-irritant to the skin, as I have proved on several occasions by dipping a horse fourteen times in fifteen days. Tests have also been carried out with many other forms of treatment, but so far the only one bearing comparison with calcium sulphide is Cooper's arsenical dip, which has proved very efficacious.

SO_2 Gas.—As a result of the report published by Veterinary Major Lepinay, of the French Veterinary Service, this method of treatment has been tested in several of our veterinary hospitals. The first series proved conclusively its efficacy in psoroptic mange, but the results obtained, though encouraging, were not so satisfactory in advanced cases of the sarcoptic variety.

With the apparatus at our disposal we were only able to obtain a 2 per cent. concentration of SO_2 gas in the chamber, and it was thought that this was the reason of the failure.

With a view to rectifying this, the next series were carried out with SO_2 gas obtained from liquid SO_2 contained in iron cylinders under pressure. By this method a 5 per cent. concentration of gas was obtained in the chamber in fifteen minutes, and animals were exposed to it for varying periods of from 30 to 60 minutes. The results were, if anything, less satisfactory than the first.

It is worth remarking that the first series were carried out in the summer; the internal temperature of the chamber was about 24° C., and the patients sweated freely the whole time. The second series were carried out in November; the weather was cold; and although the animals were wetted before being put in, they dried rapidly and remained dry.

The points which would suggest themselves for discussion are:—

1. (*a*) Are the so-called forage acari pathogenic to the horse, and if so, which varieties; (*b*) What lesions do they cause, and can they be differentiated from those of sarcoptic mange? (*c*) Do any varieties of forage acari breed on the horse?
2. Is the demedox foliculorum responsible for lesions in the horse, or is this parasite purely accidental?
3. *Treatment by SO_2 Gas.*—(*a*) Is heat or moisture, or both, necessary? (*b*) What percentage of gas and length of exposure is essential to ensure certain cure in cases of sarcoptic mange?
4. How long do corrugation of the skin and prurigo continue after an animal is cured of sarcoptic mange?

DISCUSSION.

General Moore stated that at the end of the winter last year many cases of mange existed in the British Expeditionary Force, but they were rapidly cured. The task of curing about 3,000 cases in two months was undertaken and accomplished. At the end of the summer mange gave little trouble; but now the winter is here it is increasing

again, and no doubt by the end of the winter the number of animals affected will have assumed considerable proportions.

The most successful treatment adopted has been, undoubtedly, the calcium sulphide baths. Previously, treatment had been by application of sulphur with an oily basin, but it was found that debilitated animals with mange did very badly and lost condition rapidly. As a standard treatment this preparation was, therefore, abandoned, though still used for individual severe cases of sarcoptic mange. As a general rule, however, even these cases responded well to the calcium sulphide baths.

Treatment with SO_2 gas has been tried, but up to the present has not yielded uniformly satisfactory results. This winter a more extended trial will be given, as more suitable and larger numbers of cases will be available for experimentation than was possible when the method was first tried.

The process of generating the gas was a very simple one, artificers of the Army Veterinary Corps making the generators; but a sufficient percentage of gas—i.e., 2 per cent.—was not obtainable. Since then, liquid SO_2 has been tried, as this does away with the generator altogether, but whether it will prove better than the generator remains to be seen. It is very simple and very cheap, the cost being approximately 9d. per horse.

General Fray declared that if ointments are used, without the horse having been previously clipped, their action is very limited; whereas if clipped a debilitated animal may die from exposure. This being so, he thought it would be found impossible to have any effective treatment for severe cases at the Front. Mange ointments were only suitable in mild cases.

With regard to the treatment by SO_2 gas, General Fray did not consider that the gas generator had been perfected yet, and that no doubt a better and more efficient one would be forthcoming later on. He considered, however, that the apparatus used by the French Veterinary Service was very good. His experience with this system of treatment proved to him that it was necessary to generate heat in the gas chambers as well as the gas, in order to render the parasiticide action of the gas effective. A heavier density of gas—for example, 5 per cent.—was not of itself sufficient to kill the parasites in the skin; a 2 per cent. density, plus 30° C. of heat was, in his opinion, required. This probably explained the better results Major Wadley had obtained when the SO_2 was generated from sublimed sulphur by heat, even at a concentration of 2 per cent., than when he used liquid SO_2 at a concentration of 5 per cent. without heat.

The sulphurous anhydride method for the treatment of mange,

in his opinion, was good, and therefore to be recommended. It was essential, however, to ensure a sufficient density of gas and an effective temperature.

The affected animal must remain at least one, and even two, hours in the sulphurated chamber.

General Fray, continuing, said that mange was a disease arising out of a debilitated condition of the animal, such condition being largely induced by insufficiency of food which prevailed at times, and the difficulties attending the grooming of animals at the Front.

Two species of acari were often met with in the same animal—viz., the sarcoptic and psoroptic, which were responsible for causing generalised mange.

Questioned as to whether it was advantageous for the horse to be wet when brought into the chamber, General Fray said that the matter was disputed. He thought it better that the horse should not be wet before being submitted to the SO_2 treatment, because the action of the gas dehydrates the tissues of the parasite.

Cure is often attained after two sulphurous anhydride baths, with a twelve days' interval between them.

General Moore stated that in the British Army animals were sent down from the Front as soon as mange was observed, whilst in the French Army he understood that only those were evacuated which it was deemed impossible to cure at the Front.

General Fray remarked that the British Veterinary Service were very fortunate in being able to evacuate their mange cases in that way. It was not possible for the French to do the same.

With regard to the influence of forage acari on the horse, General Fray expressed the opinion that those organisms were not pathogenic, but that they undoubtedly caused a certain amount of pruritus, as was the case with lice.

NOTES.

Major-General J. Moore, C.B., opened the Conference with introductory address, which varied only very slightly in detail from introduction already drawn out.

General Fray, in reply, said he had the honour of bringing to General Moore and his officers the hearty greetings of the French veterinary officers, whose feelings he was there to express. General Moore had had the happy and kind thought of assembling in Abbeville authorised representatives of the Allied Veterinary Corps, and wisely deemed that they would greatly profit by knowing each other better; by exchanging their views and impressions about the good working of their services; and, lastly, by reciprocally benefiting from the clinical

observations of each other from their therapeutic experiments, and the results gained as regards treatment of the diseases prevailing in their Forces. General interest, veterinary science, and good comradeship had much to gain from such friendly meetings as General Moore had been good enough to initiate. General Fray congratulated General Moore on his having been recently promoted to the rank of Major-General.

Major-General Moore briefly thanked General Fray for his kind words.

NOTE ON THE RESULTS OF A CERTAIN NUMBER OF OPERATIONS FOR LARYNGEAL PARALYSIS ON ACTIVE SERVICE.

By Colonel NEWSOM, C.M.G., D.D.V.S.
Army Veterinary Service.

That Laryngeal Paralysis should make its presence felt amongst the animals of the British Expeditionary Force was inevitable.

Very early in the campaign it became evident that inefficiency from this cause was high enough to justify operative measures in dealing with the disease provided it could be shown that animals could be made workably sound within a reasonably limited time as the result of such measures.

A few special cases were selected for operation by certain special surgeons, and as the results of these proved that under normal conditions a fair proportion of otherwise useless animals could be made workably sound in from five to six weeks, it was decided that the operation should be generally adopted.

In determining whether or not operative interference should be resorted to the following points were considered :—

Age.
Condition.
Conformation.
Degree of respiratory distress evinced when called upon to perform work of the class to which each patient belonged.

Speaking generally, no animal was operated on unless :—

1. Not over 14 years of age.
2. In fair condition.
3. Of good conformation, dependent upon its class.
4. So seriously affected as to be incapable of performing the ordinary work of its class.

The following figures give the results for nine veterinary hospitals on Southern L. of C.

No. operated upon.	Average time.	No. discharged to duty.	No. unsuccessful.	No. remaining.
410	6½ weeks.	364	30	16

In the early operations the majority of operators used the fingers, and generally stripped both ventricles, but latterly the Burr has come into more general use, and as a rule only the affected side is interfered with.

The general after-treatment has been to keep the patients quiet and to interfere as little as possible with the wound. When the external wound has healed walking exercise is begun and gradually increased until the fourth or fifth week, when a trial can be given.

Every animal discharged for duty is subjected to a severe test prior to discharge, and none are passed which are not fit for the particular work of the class to which they belong.

The number of absolute cures are not recorded except in one hospital, which reports as follows.

No. operated on.	Completely cured.	Cured and Workably sound.	Died or destroyed.
187	50	132	5

These figures give a rough result of 27 per cent. complete cures and 70 per cent. sufficiently relieved to do good work.

That the cure or relief has been permanent in all instances cannot be claimed, since from time to time cases have found their way to hospital in which severe laryngeal changes have developed as a sequel to the operation, but in proportion to the numbers dealt with the figures on this account have been very small.

TREBLE STRANGULATION OF THE ILEUM IN A HORSE.

By Captain R. C. G. HANCOCK,

A.V.C. (Special Reserve).

A BAY GELDING RIDER received a feed of oats mixed with chaff at 3.45 a.m. At 5.15 he was taken out and ridden 3½ miles. He was led home, arriving back at camp a few minutes before 7 o'clock. The only notable occurrence while he was out was that a few hundred yards from home on the journey back he shied and reared at a car. On arrival at camp he was taken to the water-trough. After a few gulps he lay down, rolled, got up, and refused to drink further.

After unsaddling it became evident that he had colic. He was walked about until seen by the sergeant A.V.C., who gave an ounce of chloral hydrate at 7.30. Short, sharp spasms occurred at intervals of a few minutes. At 9.30 a.m., when I visited the animal, I found him lying on the left side, sweating and exhausted after a bout of struggling. Respirations accelerated (24); temperature 98°; pulse imperceptible; mucous membranes anæmic.

From Stomach
a
b
c
Ileo-Caecal Valve
Fig. 1.
From Stomach
a
d
c
I. Cl. V.
Fig. 3.
From Stomach
a
d
Mesentery
Ileo Caecal Valve
b
c
Fig. 4.
From Stomach
a
d
c
b
Fig. 2.

Rupture of the bowel, or gangrene supervening on twist, were suggested by the symptoms.

After my departure, the horse got up and appeared considerably better. At 11.30 pulse was 42, temperature still subnormal. Four drachms of aloes were administered. Intermittent colic, but less marked, occurred throughout the rest of the day and through the night. At 11.30 a.m. of the following morning the horse died.

At the *post-mortem*, when the abdominal cavity was opened, a quart of blood-coloured fluid escaped. The stomach and bowels were removed for examination. The former was opened, and nothing abnormal was noted, save that the quantity of food appeared considerably greater than the feed alleged to have been given at 3.45 a.m. the previous day. The small intestine was normal in appearance throughout its length, until the last part of the ileum was reached. Here a complicated knot of strangulated bowel was found closely opposed to the large intestine. For examination the knot was cut out. Considerable difficulty was found in analysing the knot, partly from its complexity, partly from its extreme tightness. A sketch was first made (Fig. 4), and then the loops were loosened. With the aid of a piece of string the structure of the knot was reproduced.

Fig. 1 shows the original loop (*a*); into this loop a second loop interposed itself in the manner shown by the arrows, eventually lying as shown at Fig. 2 at (*b*). To further complicate this, a third loop of bowel between (*d*) and the ileocoecal valve (Fig. 2) became included in the original loop (*a*). Then the tightening of loop (*a*) on these two secondary loops led to strangulation of all three (Fig. 3). The letter references in Fig. 4 are placed as in the three preceding diagrams.

The length of bowel involved in the knot was just under a yard.

SOME REMARKS AND SUGGESTIONS ON THE VACCINE AND SERUM METHODS OF TREATMENT OF ULCERATIVE LYMPHANGITIS (LYMPHANGITIS ULCEREUSE-NOCARD).

By Captain E. A. WATSON, C.A.V.C.,
A.V.C. Bacteriological Laboratory, B.E.F.

During the past nine months 35,000 doses of vaccines and serum have been supplied by the A.V.C. Bacteriological Laboratory to various Units, for treatment of ulcerative lymphangitis.

There are many difficulties and possible sources of error in arriving at definite conclusions as to what can be accomplished by vaccine and serum therapy in this disease, but commenced in time, and fully carried out on the principles of immunisation, it is unquestionably

superior to any other method of treatment that has been employed. The evidence already produced and figures given in the different reports and returns indicate that a very large percentage of affected animals treated by vaccine methods recover and are cured. But, unfortunately, there is no positive evidence or reliable data, except in the case of a few experimental animals, as to the duration of the recovery and immunisation, or to show whether the disease is actually or permanently cured, or only tolerated, and apt to recur. There are grounds for belief that recovery is more or less complete. Certainly, for the period the animals remain under continuous observation we do not meet with recurrences that made the earlier methods of treatment, other than by vaccination and immunisation, appear so discouraging and hopeless, but the period of observation has been all too short to permit of a definite conclusion.

Fresh exacerbations and recurrences are characteristic of the usual course of ulcerative lymphangitis, and it is of the utmost importance to ascertain whether or not the remarkably good results following vaccine and serum treatment are permanent or temporary.

To obtain the necessary evidence on this much-debated point the following suggestions have been made :—

1. A large number of horses that have to all appearances completely recovered from ulcerative lymphangitis as a result of vaccine treatment should be kept under direct and continuous observation for a period of six months at least. Such animals could be permanently employed for transport work in veterinary hospitals, convalescent horse depots, and in local transport camps in touch with veterinary units, where frequent inspection can be made and a careful record kept.

2. Only such animals should be selected —

(*a*) As have undergone a full course of vaccine treatment or immunisation, and of which a complete record has been kept, and

(*b*) Which have exhibited unmistakable evidence of the disease.

3. The history of the cases, and all data as to severity and extent of the lesions, complications, sequelæ, etc., should be carefully recorded.

4. Animals should be divided into groups or series according to different methods of vaccination or immunisation employed. For example—

(*a*) Anti-Preisz-Nocard bacillus.

(*b*) Polyvalent mixed vaccine (Preisz-Nocard Bacilli—Streptococci and Staphylococci).

(*c*) Prepared pus vaccine.

(*d*) Serum.

5. The number of animals in each group could be added to from time to time, according to accommodation available and the facilities for observation. Fair evidence could be obtained from groups of fifty horses; but it may be possible to employ a lesser number in some Units, and a greater in others.

The animals employed in the above connection should be specially marked or branded.

A suggested plan that all animals treated for ulcerative lymphangitis should be branded offers a number of disadvantages. In the first place there would be a number of cases of doubtful or inaccurate diagnosis; secondly, there would be no distinction between those treated by vaccines and serum and those by other methods; and, finally, it would be very difficult or impossible to collect accurate data, or follow the subsequent career of the majority of the branded animals scattered over the country.

Much more valuable information will be obtained from a limited number of cases held under close observation under the conditions indicated above.

In reports and returns coming in on the treatment of ulcerative lymphangitis, there are still to be noted sources of error, and a grouping tending towards misleading conclusions.

For example, in the last report from —— all cases admitted are included in the summaries, namely, 1,400. Of these, 229 were destroyed. An analysis of these 229 shows 105 more sent away without treatment at all, and 16 after treatment by other means than vaccine. And of the 108 sent after vaccine treatment it is admitted that many were sent a few days after arrival at the hospital. To judge of the efficiency, or otherwise, of a method of treatment, only such cases should be considered in which the method and course recommended has been fully carried out, and only such cases in which the disease is not so far advanced on admission for treatment as to make a recovery a remote possibility.

On the other hand, the number of cases given as cured may be overestimated, for there is a marked tendency to discharge such animals as cured as soon as the existing lesion has dried up, which may be after only one or two injections of vaccine, and without any regard to the principles of immunisation which underlie the vaccine and serum methods of treatment.

There is one point upon which all observations and opinions agree, and that is the importance of commencing the treatment in the early stages of the disease. When this is possible the results are excellent, and the available evidence, though not conclusive, indicates that in such cases, and after a full course of treatment, the cure is complete

and permanent. The duration of the immunity is not known—it is, in fact, relative, and not absolute. Experimentally it is possible to re-infect an animal two to three months after a course of immunisation, but in such cases only a very mild lesion has developed, and quickly healed, and the result is a higher degree of immunity for a further period. In such manner it has been possible to hyper-immunise animals against enormous doses of virulent cultures. It has also been established that treatment commenced when the disease has reached an advanced stage, when secondary and even multiple pyogenic infections have ensued, involving tendon sheaths, bursæ and capsules of the joints, is of little avail. Hardly any other result could be expected under such conditions, and obviously the conclusion is to commence treatment in the initial stages.

There is usually an interval of a week to ten days between the development of the first ulcer, or abscess, and the second, and every effort should be made to commence the vaccine treatment during this interval. A supply of vaccines or sera sufficient to enable the first dose to be given at the Reception Hospitals, Mobile Veterinary Sections—or, better still, in the Unit where and when the disease is first diagnosed—and the continuation of the treatment at the veterinary hospital will save a great many animals for further military service.

APPENDIX.

Experimental Series G. (A.V.C. Bacteriological Laboratory):—

For a comparison of the results following subcutaneous injections of different preparations of vaccines and immune serum.

Twenty horses were selected out of 100 or more affected untreated animals in order to provide a series of similar cases characteristic of the disease in its not too far advanced stages, but sufficiently established to thoroughly test the efficacy of the modes of treatment. Each animal exhibited typical lesions of the disease—one to three discharging abscesses or ulcers in the region of the fetlock or hock. The twenty horses chosen were subdivided into four very similar groups of five—A, B, C, and D.

SERUM AND VACCINES.

1. The *serum* was obtained from horses immunised to large doses of virulent cultures af Preisz-Nocard bacilli.

2. Anti-Preisz-Nocard vaccine was prepared by the alcohol-ether method.

3. *Polyvalent mixed vaccine* contained mixed strains of pyogenic streptococci, staphylococci, and Preisz-Nocard bacilli, originating from ulcerative lymphangitis lesions.

4. *Pus-vaccine* was prepared from pus collected from unopened abscesses and from purulent kidneys in cases of the disease. Micro

examination of the pus showed the presence of Preisz-Nocard bacilli, and from the pus pure cultures had been obtained.

TABULATED SUMMARY OF RESULTS.

	Period of Observation.	Completely healed. Apparent cure.	Nearlyhealed Probable cure.	Slow progress.	Lesion persist or recur.	Total number of cases.
Group A.	21 days.	3	1	1	—	5
,, B.	,,	2	3	—	—	5
,, C.	,,	4	1	—	—	5
,, D.	,,	2	2	1	—	5
		11	7	2	—	20
Group A.	50 days.	2	—	1	2	5
,, B.	,,	5	—	—	—	5
,, C.	,,	4	—	1	—	5
,, D.	,,	2	1	1	1	5
		13	1	3	3	20
Group A.	70 days.	3	1	—	1	5
,, B.	,,	5	—	—	—	5
,, C.	,,	5	—	—	—	5
,, D.	,,	2	2	1	—	5
		15	3	1	1	20

TREATMENT.

Group A.—15·0 c.c. serum daily for twelve days, followed by pus vaccine at intervals of four days—3 to 5 doses in all. Finally, three cases not progressing very well received two injections of polyvalent mixed vaccine.

Group B.—15·0 c.c. serum daily for twelve days, and in addition on the first day and at subsequent seven-day intervals anti-Priesz-Nocard vaccine.

Group C.—Anti-Preisz-Nocard vaccine only; five to seven injections at seven-day intervals.

Group D.—The five animals in this group received 14, 10, 9, 8, and 8 injections of pus vaccine, respectively. In addition, three cases not doing well received two doses of anti-Preisz-Nocard and two doses of polyvalent mixed vaccines.

The results are given in tabulated form below.

The best results were obtained in Groups B and C, in which all cases remain apparently cured, and in which no fresh lesions developed during the seventy days period of observation.

In group A two cases showed persisting or recurring ulcers, and in group D one case.

Rapid improvement follows the use of serum and pus vaccine or of the latter alone, but it is not always maintained. The pus vaccine is not rich enough in Preisz-Nocard bacilli to produce the required amount of anti-bodies to overcome severe infection.

The number of animals in the above series is too small to permit of final or definite conclusion, but the results confirm those obtained in previous series as to the remarkable efficacy of anti-Preisz-Nocard bacillus vaccine, and indicate the superiority of that method of treatment.

An anti-Preisz-Nocard B vaccine sensitised with immune serum is now in preparation, from which still better results may be looked for.

TREATMENT OF INJURY OF THE SPINE IN THE DOG BY SUSPENSION.

By G. MAYALL, M.R.C.V.S.

Bolton.

On April 4th I was called to a fox terrier dog that had been knocked out by a motor. I found him lying prostrate, quite unable to stand, with considerable pain over the loin region and abrasions on the right eyelid and forehead. He was brought into the infirmary and treated with doses of pot. iodide and nux vomica, and rubbing of the loins with soap liniment. He improved somewhat up to April 8th, when he was able to stand when supported, but the posterior half of his spine took a semi-circular shape, and he had little control over his right hind leg, and seemed partly paralysed on one side. I was anxious to do all I could for the patient as his master wished me to spare no trouble and expense, and the dog was a good plucked one. On April 8th, however, I felt things were rather at a standstill, so I consulted my old friend "A Dictionary of Treatment," by William Whitla, M.D. There, under "locomotor ataxia," I found some lines on Charcot's method of suspension in spinal lesions and locomotor ataxia. The method in human treatment is to suspend the patient by the chin and occiput with some slight support—in heavy patients by arm straps. Half a minute is sufficient for the first suspension and subsequent ones should extend to two or three minutes. Three theories are founded on the treatment: (*a*) Charcot believes that suspension acts like a nerve-stretching operation, and that at the same time important

changes in the circulation take place ; (*b*) Lauder Brunton believes that it acts like massage on a muscle, and thus insures the removal of waste products and lymph, at the same time increasing the processes of repair and oxidation by promoting a freer blood circulation ; (*c*) Althaus suggests that suspension produces its good effects by stretching and breaking down the newly-formed connective tissue resulting from inflammatory changes about the posterior nerve roots (which exerts pressure upon the nerve tubules) and thus enables them to resume their functions, if not already destroyed.

I did not suspend this dog by his jaws and occiput, but after putting him on his back and working his hind legs by flexion and extension for a minute or two, I then held him up by his hind legs clean off the ground for a minute or so twice daily, and finished the performance by giving him a shake down, while holding him so that there was tension on the hind legs and spine. After the third day there was a visible improvement. The spinal curvature was straightened and the right hind leg began to come in normal use. The dog now walks about quite well, and I am hoping the recovery will be permanent.

HEPATIC ECHINOCOCCI AS A MECHANICAL CAUSE OF CHRONIC TYMPANITIS IN CATTLE.

By Henry B. Eve, M.R.C.V.S.,
Folkestone.

Subject.—An aged, roan cow, half-bred, unthrifty ; looked like a tuberculous subject.

History.—The owner informed me that the cow seemed to suffer from chronic indigestion, and had encountered repeated attacks of "hoven," for which complaint he had periodically treated her himself, and given various patent medicines which had only temporarily relieved her. He had dieted her as far as possible, consistent with the war rations, but without success. The cow was barren.

Symptoms.—The usual ones were present, indicating "hoven," appetite varied, rumination irregular, the animal appeared dull, listless, pot-bellied, and grunted, frequently grinding its teeth. Icterus slightly present.

Diagnosis.—"Chronic Tympanitis," perhaps resulting from a foreign body present, or enlarged mediastinal tuberculous gland, complicated by liver disease (gall stones).

Prognosis.—Unfavourable.

Treatment.—Punctured rumen, and left canula in position for a week. Administered various medicinal reagents, *e.g.*, chinosol, terebene, acid carbolic, sodae hyposulphite, direct through the medium of canula, to counteract fermentation, which gave relief for

a few days. Later on removed canula, and gave internally, soda bicarb., zingib, gentian, nux vomica, and pip cayenne and ammon. carb. in gruel. Applied mustard externally. Gave salt in feed.

Result.—Disappointing; animal began to lose flesh, so advised slaughter, as both myself and owner were fed up with the case.

Post-mortem.—The liver was tremendously enlarged, simply invaded with "multilocular echinococcus cysts," weight about 60 lb. at a guess. Ascites present, also echinococcus cysts in lungs. No lesions of tuberculosis present. The stomachs were normal, and no gall stones.

Remarks.—The cysts had ruptured in places.

I conclude that the enlarged liver mechanically produced the tympanitis by exercising pressure upon the œsophagus and prevented the eructations which are physiologically necessary to oxen. I surmise that the fluctuations in the intensity of the tympanitis, which were observed, may have been due to rupture of the cysts, with consequent temporary decrease in size of the liver, and, of course, some abatement of pressure.

P.S.—Owner wouldn't pay for tuberculin test.

NOTES OF A CASE OF COMPLETE DISLOCATION OF THE LEFT FEMUR IN A COW, WITH ROUGH DIAGRAM SHOWING THE CHARACTERISTIC RECUMBENT POSTURE.

By Capt. A. R. ROUTLEDGE, F.R.C.V.S.
Army Veterinary Corps.

On being called as a second opinion to a recently calved milk cow I learned that ten days ago she had slipped her left leg outwards in turning away from the water trough, the ground around being very greasy; with assistance she hobbled to a shed, falling twice on the way, went down and had not been on her legs since.

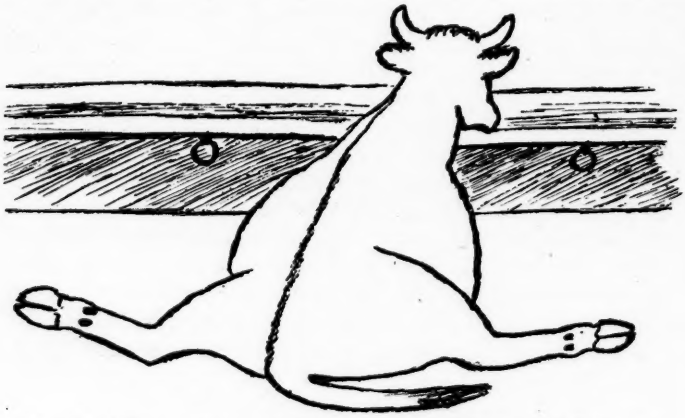
She appeared quite comfortable in a normal position, except that the left leg was at right angles and away from the body. On being coaxed to rise she got on her knees, but as soon as an attempt was made to raise the hind quarters, the left leg slipped outwards and she gradually slid on to her udder and could not be persuaded to make another effort to get up.

On examining her pervaginum, the articular head of the femur could be distinctly felt in the obturator foramen; when an assistant abducted the limb it moved, and the limb could be carried upwards almost vertical to the spine. She was promptly shot.

The specimen shows: — 1. The ruptured ligamentous tissue forming the hip joint still adhered to the socket joint.

2. Wearing away of the bony rim of the cotyloid cavity, especially at its posterior part.

3. A well marked groove on the head of the femur between the articular head and great trochanter where the dislocated femur had



Characteristic recumbent posture in dislocation of the femur (left) in cow.

been "riding" on the internal edge of the ischium, the bone being worn quite smooth.

I had a similar case about six years ago, the cow having had a bad slip in a railway truck.

SARCOPTIC MANGE IN THE DOG AND PURULENT OPHTHALMIA IN A BULL BITCH.

By G. MAYALL, M.R.C.V.S.,
Bolton.

THREE Pekingese spaniels were brought in on April 2nd, suffering from sarcoptic mange. They were dressed with an ointment made up of 1 part of styrax, and 1 part of sulphur to 8 of lanoline and vaseline mixed, to which a little menthol was added. The ointment was applied every other day. The redness and irritability of the skin soon declined under this treatment, coupled with the administration daily of two tablets per dog of stannoxyl finely powdered and mixed with sloppy food. On April 13 they were given a nascent sulphur bath, and were sent home in a good state.

Bull bitch "Betty" brought into the world by Caesarean section, performed by me two years ago, had sarcoptic mange badly round about the face and eyes, and on the neck, and the great irritation had caused the bitch to paw her eyelids so much that the eyes were badly inflamed, and both discharging a purulent matter which collected in

the corners and under the lids, and made the bitch a sorry object. I made a lotion of boracic acid and zinc sulphate to which a few drops of adrenalin were added, and cleansed the eyes daily with it. The mange was treated with the before-mentioned ointment. Internally three stannoxyl tablets powdered were given daily. Under this treatment the bitch improved greatly, and the purulent discharge lessened considerably in quantity, and gradually disappeared. There is an opacity of the lens in one eye and some cloudiness in the other eye, but the bitch has vision enough to enable her to get about fairly well.

One of the Pekingese dogs voided a number of worms whilst under treatment with the stannoxyl. The effect of the drug on the skins of all the dogs was good, and the medicine certainly seemed to lessen the discharge in the case of purulent ophthalmia. All the dogs took the medicine quite well in the powdered form when mixed with the food.

BRAXY: WITH SPECIAL REFERENCE TO THE DISEASE AS SEEN IN NORTH CARDIGANSHIRE.

By E. MORGAN, M.R.C.V.S., D.V.H.

BRAXY is a sudden, acute disease of young sheep which runs a rapid course and usually terminates fatally. This disease is known by different names in different countries, and even in the same country the appellation may vary—thus in Cardiganshire it is best known as "Dwfrcoch" (Red-water) and "Gwaew Hydref" (Autumn colic); in Scotland as "Braxy" or "Redbraxy" and "Sickness"; in Ireland as "Braxy"; in England as "Red-water"; while in Germany, Denmark, Norway and Iceland it is known as "Bradsot" or "Braasot." The universal term, however, is *Braxy*, which apparently means—"sudden sickness followed by sudden death."

In Cardiganshire there is no other disease so much dreaded by the sheep farmer as braxy. It may be called a seasonal disease, as it is observed almost exclusively from September until the end of January, and of these months November is the worst. Young sheep, under one year old, usually fall victims; only on rare occasions have I noticed a case in sheep over that age.

I am unable, owing to want of statistics, to give the actual percentage of losses, but I know that in some parts of Cardiganshire it is rather high; I have seen it on our own farm as high as 35 per cent. of the lambs. Sheep farmers who winter their lambs away from home, down in the lowland, make careful enquiries beforehand as to whether the farms are subject to braxy, and if they learn that the percentage of deaths during the previous seasons was not above 5 per cent. they will not hesitate to hire the farm for the winter, provided other conditions are suitable.

From enquiries made from old farmers in the district, braxy seems to have been even more prevalent years ago than at present, but it must be borne in mind that not only is sheep farming now carried out on far different lines, but that this disease is chiefly responsible for the introduction of many of the new methods. Farmers used to keep their wether lambs until they were one or two years old. The farmers on the high hills still adhere to the old custom of keeping them until about four years old; these stand a better chance during the winter than those of the small farmer on the hillside who keeps all his lambs at home, and has consequently no choice to make, but the farmers who run a large sheep-walk up the mountains tack their lambs on hired farms down the lowland, and they know which farms are free from braxy. There is yet another class of farmer who sends his sheep up to the mountain in summer as tack sheep. He, as well as many of the small hillside farmers, used to keep their lambs and sell them as store wethers when they reached the age of one or two years, but owing to loss from braxy, and for other reasons, they now either feed them early in autumn for the butcher—or (if a small hillside farmer) sell them to another farmer lower down the vale, who does the fattening up. Note the difference in the number of wethers at the Tregaron market in the spring to what it was about twenty years ago. Many farmers are afraid to run the risks of braxy, and often sell some of their best ewe lambs as well as the wether lambs.

Although, apparently, this disease has ravaged the flocks of Cardiganshire from time immemorial, most writers on the subject consider Wales to be free from the scourge. Perhaps the local terms in use for the disease may, to a certain extent, account for this error, but it only proves how little attention has been paid in the past to the diseases of sheep, not only in Cardiganshire, but throughout Wales. I admit that before I went up to Scotland I was under the impression that the braxy of the Scotch sheep was a different kind of disease altogether to the red-water of the Welsh ones, but being interested in sheep, it was not long before I learned that they were similar diseases. In order to further satisfy myself, as well as some other students at the Liverpool School, I had more than one carcase and parts of carcases sent up from home, by which means all doubts were cleared up. Since that time I have dropped the old term "red-water" and use the universal one of "Braxy," as I consider it is advantageous to do so.

Professor Hamilton, of Aberdeen, in discussing upon one occasion this particular disease, said—"We Scotch are proverbially a long-suffering race, but in this matter it seems to me that those having their interests centred in sheep farming have erred through over-

forbearance." Would not the above remark apply still better to us in Cardiganshire? Here there are diseases of sheep which no one in the past has considered worthy of attention. We must, however, give credit to the Scotch, who have spared no pains in investigating the causes of and how to cure the diseases of sheep. The same cannot be said of the Welsh, though this may be due, as Professor Hamilton remarked, to over-forbearance, but the fact remains that there are diseases, such as "Louping ill" (Trembles), "Cryndod," "Clefyd du," and various others, which have been up to the present without names, at least in Cardiganshire.

The Highland Society furnished Professor Hamilton with a grant of money for the purpose of carrying on researches in regard to braxy, and I understand that again during the last few years a similar grant has been provided by the Development Commission (through the Board of Agriculture for Scotland) to enable a further study of this disease to be made.

In looking over some very old literature on diseases of animals, it is interesting to note that the diseases of sheep were, at one time, engaging a good deal of attention, but the work was conducted under great disadvantages, as the knowledge of bacteriology was then in a very elementary stage. In "The Book of Husbandry"—a volume published in the sixteenth century—I have found some most interesting information about the different diseases of animals. Braxy is here termed the *Blud*, and is described as follows:—

"There is a sykenes among shepe, called the blud. The shepe that hath it will dye sodainly or he wyl stand styl and hange downe the head and other whyle quake. If the shepherds can espy him, take him and rub hym about the hede and especially about his ears and under his eyen and with a knife cut of his eares in the mydst and also let him blede in a vain under his eyen and if it bleede well he is lyke to lyve and if he bleede not, then kyll him and save his flesh, for if he dye himself the flesh is lost; and the skin wyl be far ruddier like blud more than another skin shal be, and it taketh most commonly of the fattest and best lyking."

The above description, although written in the year 1575, should appeal to everybody who has seen a case of braxy as a good description.

I see that the author of another book refers to *braxy* and *red-water* as two separate and distinct diseases, but from his description one can clearly see that they are really one and the same.

Even at the present day in Cardiganshire, many farmers believe that what they call "Gwaewr Hydref" and "Dwfrcoch" are also two different diseases. It is true that Gwaew (colic)—*per se*—occurs in sheep, but it is not nearly as prevalent as it is supposed to be; when, however, it does occur, the lamb more often than not

recovers. Hence the reason for the belief that braxy cases need not always terminate fatally.

A great variety of opinions have existed, and still exist, concerning the cause of braxy. We shall, therefore, make it our aim in this paper to supplement the portion of truth we have ourselves found with that discovered in the past. Many of the theories may not be completely right, and perhaps none are completely wrong, but as most of them are based upon an ultimate fact, we may reasonably assume that some essential verity can be looked for. Furthermore, several important discoveries have germinated from the experiences of past observers, as instanced by the case of James Hogg (better known as the "Ettrick Shepherd") who, from the time he was a small boy tending sheep, was possessed of superior powers of observation, the results of which are beneficial to this day. In Hogg's boyhood, "Sturdy" (Bendro) was the most prevalent disease among sheep, and this caused him a good deal of trouble until he found the following easy method of relieving it. I quote from his own writings :—

"When I was a youth, I was engaged for many years in herding a large parcel of lambs, whose bleating brought all the sturdies in the neighbourhood to them, and with whom I was everlastingly plagued, but as I was frequently knitting stockings, I fell upon the following plan : I caught every sturdied sheep that I could lay my hands upon, and probed him up the nostrils to the very brain with one of my wires. I beheld with no small degree of pleasure that by this simple operation I cured many sheep to different owners, but I kept all my projects to myself, for I had no authority to try my skill on any of them."

Hogg's Views on Braxy.—"The disease commences about the middle of October, and the universal ravages of the young flocks through all hardy districts and farms in the nation set in early or late in proportion as vegetation ceases early or continues till a later period of the season. In the middle of autumn the hoggs are put into rich pasture—they do very well on it, until the frosts commence, often very suddenly ; causes the plants to become dry and astringent, and the temperature of the air acting upon the bodies of the animals induces them to search after and feed more upon heath, bent, and other herbs of a more hardy and hot nature. They devour these with great voracity. This causes braxy. The heath being as costive and hard of digestion as the other is soft and easy, the consequence is now easily seen through—at least by a man of science—but as it is easier for me who am no anatomist to conceive than to describe, I shall not follow out its process farther for fear I make a fool of myself, and they who do so get many to help them. That the above is the cause of that braxy which has cut off so many thousands of excellent young sheep not the least doubt need to be entertained. Any shepherd will tell you that it is on sudden changes from fresh weather to a frost its ravages are most felt."

Cure.—Hogg tried various medicines, but without success. He finds "bleeding good," or if "they purge."

Prevention.—"Do not overstock the land," he says. "Pasture the young and old together. They should be shopped in the upper parts of their pasture for two hours in the morning. Let them not be suffered to remain too late on the grassy parts below, but again soon be put in motion outward, so as not to impair the stomach by too immoderate fills of this grass. Bleeding about two ounces of blood from the jugular vein early in November."

I have received some useful information regarding braxy, as well as other diseases of sheep in Cardiganshire, from Mr. Lloyd, Pant. Tregaron, who, like James Hogg, has been from boyhood a keen observer, and has furthermore had every opportunity of seeing the "pranks of nature in her wildest moods." Braxy used to be prevalent on his farm, occurring between the end of September and the end of January. The worst outbreaks took place upon the appearance of a sharp frost, or, worse still, a hoar frost. Then one could see, in the early morning, where the sheep had been resting the night before. Freezing after a prolonged course of wet weather is also very bad. He states that he never saw a single case of recovery. The sheep die very soon after the first noticeable symptoms of illness. Most cases occur during the night and are found dead in the morning. Lambs in good condition are decidedly more liable to the complaint than those in poor condition. Mr. Lloyd hardly lost any of the lambs kept on the mountain during the braxy season, but lost those kept down in the fields. Deaths occur equally on well cultivated ground and on poor uncultivated land where rank pasture grows. He lost few animals while feeding them on turnips and corn, but rank pasture—where cows have been grazing during the summer, *i.e.*, tathy patches—is a predisposing cause of disease. He considers fine pasture or seed fields harmless, but that mossy land is bad. Barren ewe lambs, he asserts, are more liable to the infection than those which are in lamb. Long continuation of wet weather is not favourable for the disease, and sun aspect, or *vice versa*, makes no noticeable difference, but he recommends shelter as a good preventive. He tried the pig dung treatment, and lost no lambs that season. But as some seasons are more favourable than others to the lambs, he is not sure whether it was due to the medicine or not. The latter had, however, a bad effect on them for they seemed to cease thriving, and did not begin to improve until the spring.

Braxy, as already stated, is pre-eminently a disease of young sheep. There are various other diseases amongst our domesticated animals which have this same characteristic, namely, of being diseases of the young. The older animals seem to have acquired immunity, while young, against some of these youthful complaints. For instance, "Sturdy" or "Gid," as well as Lincolnshire lamb disease, are all far

more prevalent among young sheep than among older ones. The same may be said again with regard to the distemper of dogs, the joint-ill of foals, calves, and lambs, and to various other complaints. Nor is this rule confined only to animals, applying similarly to the diseases of children.

Black Quarter of Young Cattle.—This resembles braxy in many respects, the young animals being far more liable to contract the disease than the older ones, and it is often those in good condition which fall victims to the complaint. An abundance of gas-producing bacteria are found, consisting in both cases of rod-shaped organisms. Black Quarter also resembles braxy in that it runs a rapid course and usually terminates fatally.

Braxy, as we have already seen, generally makes its appearance with the first outbreak of hoar frost, and, as a rule, lambs in good condition—*i.e.*, lambs with a fair proportion of kidney and omental fat—suffer most. The majority are taken ill at night and, more often than not, are found dead in the morning. Obviously the disease runs a rapid course, as the majority of lambs I found thus dead had been apparently quite well on the previous evening. Although on several occasions I have seen cases of braxy illness during the day-time, my experience is that they most frequently occur at night. Wether lambs suffer more than ewe lambs, and if the latter are in lamb they are less liable to contract the disease than the barren ones. Again, lambs which are born in February are less liable to infection than those born later, but the younger the lamb, the less are its chances of survival over the dangerous period. On rare occasions lambs are born very late in the season, about July, and if such are allowed to follow the mother continually, they generally survive, owing to the fact that they get a little milk and maternal care.

The disease often breaks out during sudden weather changes. A prolonged course of snow, rain or frost, is not so unfavourable to the lambs as is a change from mild weather to frost (or hoar-frost), or, on the other hand, to rain or a sudden thaw after snow or frost, as any such changes mean a chilling of the body, which seems to open the door for the enemy to enter.

The causal organisms of braxy, according to Dr. McGowan, Edinburgh, or at least the organisms belonging to the same group as those which he believes cause braxy, are normally inhabitants of the mouth and nose of sheep. When the vitality or resisting power of the body is lowered by a sudden chill, or by eating frozen, indigestible grass, these organisms immediately seize the opportunity of making an unexpected attack, in full force, upon the body guard. In view of chills, therefore, it is dangerous to turn lambs into the open late in

the evening, especially if they have been heated after a journey, or in any other way. In my opinion, November is quite the most trying month.

One year in particular, I remember seeing as many as five lambs dead one morning within a small area; they were all, apparently, healthy the previous night. That was one of the worst seasons within my recollection; we lost 35 per cent. of our lambs, most of which were wether lambs. These had been weaned about August 25th—the usual time to bring lambs down from the hills, the ewes being left behind until the end of September. I remember one farmer in an adjoining parish, who took exception to this custom. He always allowed his lambs to follow the ewes to the mountain, bringing them all down together to the farm in the month of October. He failed to see that the object of bringing the lambs down from the hills in August was to improve their condition, the pig dung drench being given them in September to reduce the accumulated fat. I understand that this farmer rarely lost a lamb from braxy.

The worst place on our farm was a field, near the farmyard, into which the cows were turned at night, until about August. In any place where cattle have rested at night, a great amount of tathy patches are always to be found. The lambs were more affected in this spot than anywhere else on the farm, and being near the house, we often saw some of them soon after they were taken ill. One season in particular, when the death rate from braxy was specially high, we began to suspect that these taths, or tufty patches, had something to do with the cause of the disease. We decided at last to keep them away from this field, and after doing so, saved the remainder of the lambs that season. This goes a long way to prove that tathy patches are, at any rate, a partial cause. Virgil, who seemed to know a good deal about the diseases of sheep, said: "Nor in too rank a pasture let them live." I have seen hungry horses turned into a field full of these taths, and after eating greedily, suffer from severe attacks of colic; they may well, therefore, be guarded against.

In this parish are two adjoining farms, of which the situation and nature of the soil are in all respects identical, and both have a southerly aspect. The hill on these farms is composed mostly of dry land, partly covered with heather, while the lowland consists of a mixture of marsh and arable land. One farmer allows his lambs to feed, for certain hours during the day only, on the lowland, always driving them in the afternoon slowly up the hill, where they spend the night. The percentage of deaths on the farm is almost *nil*. The adjoining farmer now and then drives his sheep up the hill, but more often than not

neglects to do so. Some seasons the death rate from braxy has been very high on this farm.

There are those who believe that turnips are apt to cause braxy, but I, on the contrary, have found them good preventives, though care must be taken not to allow the lambs too long a time in the turnip field for the first day or two, otherwise they are apt to die, not from braxy, however, but from tympanitis, that is if the leaves or tops are attached to the turnips. Turnips act as an aperient—most essential for young sheep when the foggage gets dry.

One year, when braxy was particularly prevalent on our farm, we decided to turn the lambs into the turnip field, allowing them also the run of an adjoining field as well; by so doing we saved all the rest of the lambs. I have also proved that good seed fields are the best pasture for lambs when braxy is prevalent in other places. Feeding with corn, along with turnips and hay, or even without the latter, is also another excellent preventive of this disease.

(*To be continued in next issue.*)

Translations.

DOUBLE-SIDED EXTENSIVE CYSTS AT THE FRONTAL END OF THE WOLFFIAN DUCTS IN A COW.

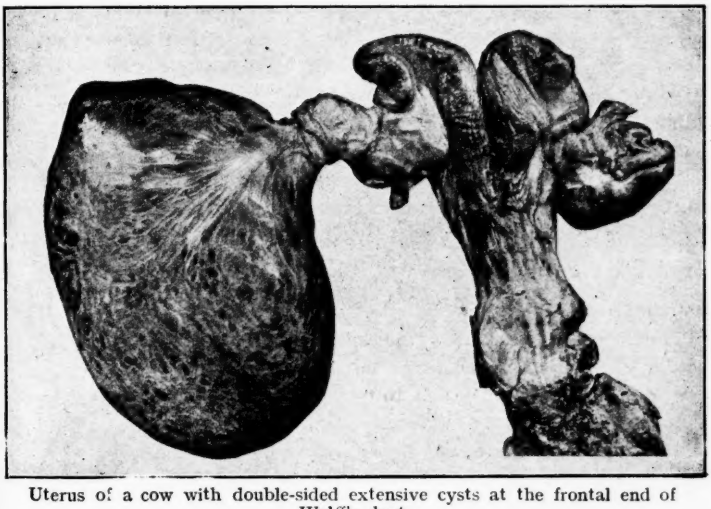
By Dr. E. WYSSMANN, *Neuenegg.*

THE condition present and described in this cow was seen after slaughter.

Anamnesis.—The cow had been purchased by the owner in the middle of June, 1916, as in calf, but soon afterwards came in bulling. On July 11 I examined her as to pregnancy and found her not to be in calf. My note at the time reads, "indurated ovaries, especially the left one, prognosis unfavourable." The owner accepted my opinion, and did not take the cow to the bull, although she was constantly coming on heat, and showed normal tension of the pelvic ligaments. Finally the cow was sold, as she was only giving 10½ pints of milk a day, and was visibly improving in flesh. Occasionally the owner had noticed a yellowish discharge from the vagina, and a marked distension of the abdomen before feeding.

Pathological condition.—No special changes in the uterus; weight (without the vagina and cyst contents), 1¼ kilos. In the vagina in front of the externalos was a ½ inch vertical rupture. At the frontal end of the left ovary there was a strong, undulating cystic bladder glistening, areolated, and brownish violet in appearance. Its dimensions were 9 inches in length, 7 inches broad, and 2½ inches thick. This sack-like bladder arose from the neighbourhood of the ovary.

and had a short neck and fine, reddish, branching vessels on its surface. The internal surface of the cyst was smooth, except at the neck, where it was roughened. The weight of the cyst with its covering was about 16 lb. The contents was a clear, dark golden yellow, alkaline, and markedly albuminous fluid, which formed no sediment on standing or boiling, nor yet with the addition of hydrochloric or acetic acid, or alcohol. The neck of the cyst completely surrounded the left ovary, which was about the size of a chestnut, and contained a large, yellow body. Only a small piece of the fallopian tube remained, because it had been cut off short, and a great portion was left in the abdomen. Similar conditions were found in the right ovary, which contained a graafian follicle about the size of a hazelnut, and a small, yellow body,



Uterus of a cow with double-sided extensive cysts at the frontal end of Wolff's duct.

and was surrounded by a thin walled transparent cyst, as big as a man's fist, and yellowish red in appearance.

This case is neither one of ovarial cyst in its true sense, nor one arising from disease of the tube; but a cyst originating from the frontal end of Wolff's duct. It is known that in embryonal development Wolff's duct is absent in numerous cases in female ruminants, and further, after birth the remains of the same shrivel up. Gartner's ducts also, according to Roder, become obliterated with the senile atrophy of the sexual organs.

It cannot be said what was the cause of this great serous cyst on

Wolff's duct, since no history of previous pregnancies was obtainable. The function of the ovaries was not entirely stopped by the cyst, as was proved by the frequency of œstrum. The cyst had obtained a point of support from the filled rumen, as ring shaped tissue strands on the frontal end of the neck showed. The cyst was certainly not an embryonal abnormality, and repeated earlier pregnancies had not hindered the development of the cyst.—*Swiss Veterinary Journal.*

G. M.

TWO NEW FEEDING-STUFFS.

Feeding of Horses on Marine Algæ.

Deputy M. Duboys-Fresney asked the Minister of Agriculture and Foodstuffs, whether, in reference to the feeding of horses on marine algæ, all measures had been taken to intensify and hasten the preparation of this food, which if distributed abundantly would allow agriculture to preserve a large quantity of its hay; and whether adequate measures had been taken to recover the by-products from the washing of the seaweed, such as soda, iodine, etc. (Question of October 9th, 1917.)

Answer.—The preparation and use of marine algæ for the feeding of horses is still in the experimental stage, and the results obtained are only of a laboratory value. The industrial trade is yet to be created. To encourage it, it is proposed to make contracts for the sale of the whole production for one year on condition that the price does not exceed that of oats. According to the latest information received, a first factory, which will be putting out stuff at the end of 1918, is in process of construction at Pan-an-Lam, near Pleubien, district of Tréguier. As for the question about the recovery of sub-products from the washing of the seaweed, this concerns specially the province of the Minister of Munitions and War Products. At the proper time it will be the subject of special attention by this Minister.—*Revue Gén. de Méd. Vét.*, January 15th, 1918.

New Food for Cattle.

At the "Instituto de Emisiones" of Stockholm a Swedish and German patent has been taken out in connection with the obtaining of cellulose as forage. The manufacture of this forage is being proceeded with immediately. It has been demonstrated by successive analyses over a number of years that the cellulose obtained from cut wood chemically elaborated will serve quite well as a food for cattle and makes forage of excellent quality. During the war this problem has been closely studied, and the experiments made have always given very satisfactory results. In Germany this forage is based on a product obtained from straw; recent experiences, however, show

that the cellulose of wood constitutes a large field for the elaboration of food destined for animals. It is evident that it does not contain the substance of ordinary forage. But by the admixture of fat in the production of cellulose the new food is in no way inferior to those known. The " Instituto de Emisiones " is doing great research work, and furthering the building of special factories and workshops for the manufacture of cellulose. Cellulose is the first material elaborated in the manufacture of bisulphates and bisulphites. Alcohol is distilled in the production of cellulose. A factory at Stora Kopparberg is proceeding to manufacture 20,000 tons of the forage. Another factory and workshops are being put up at a cost of 500,000 crowns for the manufacture of cellulose as forage. Trading in the product will commence in February, 1918.

Dr. Riman, in Sweden, has obtained a product from cellulose which he hopes to turn to use as human food. Besides the new food for cattle, further elaboration will produce a foodstuff that will go well with flour and economise it. Spain wishes to take up this new industry, as its forests and woody regions are quite suitable for the establishment of such.—*Revista de Higiene y Samidad Pecuarias.* G. M.

Abstract.

A NEW VISION OF AN OLD PLAGUE.

By B. R. ROGERS, D.V.M.,
Chicago, Ill. (*American Jour. of V.M.*)

THREE MILLION NINE-HUNDRED-AND-FORTY-SEVEN THOUSAND tuberculous pigs were found by Government veterinary inspectors in 1917 among the 40,000,000 hogs reaching packing plants having federal inspection. Most of the same old tuberculous cows that infected the bulk of these pigs are still retained on certain unknown farms. The cows are the real source of the trouble, through their milk and discharges, and the hogs are simply the signal and signboard pointing to the perennial spring of infection. In 1915 328,000 pigs were tanked for disease, and removed from the meat supply. This is more hogs than any one of seven certain States produce, and if healthy and available for meat supply these pigs would maintain an army of several thousand soldiers for a whole year, because most hogs are marketed at less than one year of age. During the calendar year 1918 most of the 6,000,000 farmers will market some hogs, and of the 60,000,000 hogs now on the farms, about 40,000,000 will reach the packing houses where Government inspection is maintained, and the inspectors will find over 3,000,000 probably 4,000,000, tuberculous hogs before January 1st, 1919. The pigs are chiefly infected from the cows. Shroeder found 40 per cent. of reacting cows passing tubercle

bacilli in the fæces. Hogs eat fæces and become proportionately tuberculous. Dr. Rogers is strongly in favour of the owner's name and address being marked by a tag in the ear of each hog sold, so that all hogs may be traced back to their source, and the cows found that spread the disease.

Demonstrations to farmers of infection of pigs by cows would in the author's view, be educative, and secure the goodwill of the farmer. This could be done by putting an affected cow in a pen along with two or three healthy pigs, or in contact with them, the pigs being fed with some of the fæces and also some of the first milk and water used to wash out the feed box of the cow. The cows and pigs may be slaughtered in about six weeks to two months, and the lesions inspected. Veterinarians, officials, and farmers should be asked to attend and observe the final slaughtering.

[There is no doubt that the tuberculosis question as affecting the pig is becoming more important every year, and to economise the meat supply, and eradicate the disease, the situation in all pig producing countries is worth consideration and needs controlling.—Sub.-Ed. *V.J.*]

Notice.

STANNOXYL.

STANNOXYL is prepared from tin and metallic tin free from lead. It is put up in the form of greyish tablets, which are used for adults in a dose of four to eight daily in the treatment of diseases arising from staphyloccal infection such as carbuncles, anthrax, acne, styes, etc. In furunculosis, from which not a few of our soldiers have suffered, it has proved an excellent remedy, and Dr. A. Compton recorded several cases treated successfully with stannoxyl, in the *Lancet* for January 19, 1918. The tablets and literature pertaining to the preparation may be obtained from the Anglo-French Drug Co., Ltd., Gamage Buildings, London, E.C.1.

In dog practice we think that stannoxyl will prove a welcome addition to the internal remedies suitable for skin complaints.

Reviews.

NOTES ON PARASITIC ANAPHYLAXIS AND ALLERGY.—By L. Van Ess and A. F. Schalk. Bulletin No. 125. North Dakota Experiment Station.

The authors have been investigating further the theory advanced by the Seyderhelms that the larvæ of gastrophilus act as intermediary hosts or carriers in the spread of the infectious anæmia of the horse. The conclusions they come to after conducting numerous experiments

do not support the views of the Seyderhelms. The authors, however, consider that anaphylactic poisoning of a more or less chronic nature due to parasites may produce such diseases as anæmia, cirrhosis, or parenchymatous degenerations. Bot. material and a solution of the secretions of the larvæ were injected into horses and experimental animals, but in no case was any diseased condition similar to swamp fever produced. A reaction was established in horses and other animals by material from various other parasites (ascares megalocephala, dipylidium caninum, taenia serrata, etc.). Eye and intradermal tests also produced reactions. The authors throw out the hint that through some of these reactions it may be possible to identify animals which act as carriers of harmful and destructive parasites, *e.g.* cœnurus cerebralis of sheep. G. M.

THE RHODESIA AGRICULTURAL JOURNAL. Edited by the Director of Agriculture, assisted by the Staff of the Agricultural Department. Published twice monthly; price 5s. per annum. Printed by the Argus P. & P. Co., Ltd., Salisbury, Rhodesia.

This October number, although for economy reduced in size, chiefly by the adoption of smaller type, contains much that is valuable and interesting. The cattle industry of Rhodesia has secured a marked step forward by the establishment at Odzi of the Rhodesia Meat Packing Co. Crop experimentation at Gwebi has been very much alive, and the work done may be slightly understood when it is stated that 475 acres of land were under crops, 250 distinct plots were cultivated, and 34 different crops were handled. Mr. J. M. Sinclair, M.R.C.V.S., has a practical "note on Quarter Evil," in which he expresses the opinion, as opposed to a view held by Mr. A. Stewart Richardson in an article in the "Journal," that the manufacture of vaccine locally is not necessary. Mr. Sinclair instances the fact that the whole of the vaccine supply for the United States (a much larger country than South Africa) is manufactured at Washington from the one and only type of the disease known. African Coast Fever shows a considerably diminished mortality figure, due to the institution and better carrying out of the process of dipping.

Mr. A. M. Fleming, M.B., C.M., D.P.H., discourses well on the part played by malarial parasites and mosquitoes in the spread of malaria and blackwater, and the Nature Notes by Father O'Neil and Miss Chamberlain on "Snakes" and "Case Weavers" respectively are full of interest.

The Veterinary Report gives disease statistics and indicates the effect of tuberculin and mallein tests on imported bovine and equine stock.

An article on "Maize Foods" will no doubt be welcomed by many readers.

The contents of the "Journal" show that real live progress is being made in Rhodesia, and that the "Journal" itself is playing an important part in the advance. G. M.

Obituary.

THE late Lt.-Col. H. M. Lenox-Conyngham was born at Moneymore, Co. Derry, and was the youngest son of Sir William and Lady Lenox-Conyngham. After taking his B.A. at Trinity College, Dublin, he spent some time in Florida, orange growing, but having a great passion for animals he returned to take up his veterinary studies at the Royal Veterinary College in London, graduating in 1896. In 1897 he joined the Army Veterinary Service, and was immediately sent to India. Between 1902 and 1904 he served in the Somaliland Campaign, for services in which he was mentioned in Despatches. In 1904 and 1905 he was on remount duty in the Argentine, being again sent to India in 1909.

On the outbreak of the great European war he went to France (September 1914) as A.D.V.S. to the Sixth Division, and his appointments during the war have included those of officer commanding No. 10 Veterinary Hospital and D.D.V.S., Fifth Army, under Sir Hubert Gough, K.C.B. For services rendered in this capacity he was mentioned in Despatches by Sir John French and Sir Douglas Haig, being awarded the D.S.O. and gazetted Brevet Lt.-Colonel.

Unfortunately his health broke down under the severe strain of war service, and he was invalided home to England in 1917. After a brief rest he was posted as Officer Commanding Tunbridge Wells Veterinary Hospital and from there transferred as A.D.V.S. of the Western Command. It was whilst holding this appointment that he was taken ill and died quite suddenly. He was a man of endearing qualities and sound common sense, much liked by all with whom he came in contact, officers and men alike. The profession can ill afford to lose such men at any time, especially during the serious exigencies of the present war. He leaves behind a widow and two children to mourn his loss.

NOTICES.

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